



PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	Klaus M. Irion, et al.
Application No. 09/994,178	Filing Date: November 26, 2001
Title of Application:	Image Pick-Up Module And Method For Assembling Such An Image Pick-Up Module
Confirmation No. 9476	Art Unit: 2615
Examiner	Yogesh K. Aggarwal

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Appeal Brief Under 37 CFR §41.37

Dear Sir:

A Notice of Appeal from the final rejection of claims 1-5, 8, 13-15, 17-19 and 21-25, all pending claims, of U.S. Patent Application No. 09/994,178 is submitted herewith. Applicant accordingly files its appeal brief in connection with its appeal. A Claims Appendix is submitted herewith, as are Appendices related to evidence previously submitted and related proceedings to the case.

Mailing Certificate: I hereby certify that this correspondence is today being deposited with the U.S. Postal Service as *First Class Mail* in an envelope addressed to: Commissioner for Patents and Trademarks; Post Office Box 1450; Alexandria, VA 22313-1450.

August 28, 2006


Meaghan M. Baye

(i) Real Party In Interest

The real party in interest is Karl Storz GmbH & Co. KG, assignee of the patent application.

(ii) Related Appeals and Interferences

There are no related Appeals or Interferences.

(iii) Status Of Claims

Claims 1-5, 8, 13-15, 17-19 and 21-25 stand rejected and are the subject of the instant Appeal. A copy of each of these claims is attached hereto in the Claims Appendix. Claims 6-7, 10-12 and 16 have been withdrawn. Claims 9 and 20 have been cancelled.

(iv) Status Of Amendments

There are no pending or unentered Amendments.

(v) Summary Of Claimed Subject Matter

The present invention as claimed in independent Claim 1 relates to an image pick-up module (10), as shown in Figure 1 and described on Page 19, lines 15-16; Page 20, lines 5-22; and Page 22, lines 1-2 of the specification. The pick-up module (10)

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includes an electronic image sensor (12), a single-piece circuit board (20) electrically bonded thereto, and at least one cable (44) electrically bonded to the circuit board (20) and leading away from the circuit board (20). The circuit board (20) includes at least three sections (22, 24, 26) integrally connected with one another and folded from a planar blank board. The first section (22) and the second section (24) extend in spaced relation to each other and obliquely or crosswise to the image sensor (12). The third section (26) is arranged between the first and second sections (22, 24) and on an end of the circuit board (20) opposite the image sensor (18).

The present invention as claimed in independent Claim 22 relates to a method for assembling an image pick-up module (10), as shown in Figure 1 and described on Page 19, lines 15-16; Page 20, lines 5-22; and Page 22, lines 1-2 of the specification. The method includes electrically bonding an electronic image sensor (12) to a single-piece circuit board (20), and electrically bonding at least one cable (44) that leads away from the circuit board (20) to the circuit board (20), where the circuit board (20) includes at least three sections (22, 24, 26) integrally connected with one another that are folded from a planar blank board along flexible connections. The board blank is folded in such a way that the third section (26) is located between a first section (22) and the second section (24) and the image sensor (18) is bonded to the circuit board (20) at an end of the board (20) opposite the third section (26).

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The present invention as claimed in independent Claim 24 relates to an image pick-up module (10), as shown in Figure 1 and described on Page 19, lines 15-16; Page 20, lines 5-22; and Page 22, lines 1-2 of the specification. The pick-up module (10) includes an electronic image sensor (12) including an image pick-up surface (14), a circuit board (20) electrically bonded thereto, and at least one cable (44) electrically bonded to the circuit board (20) and leading away from the circuit board (20). The circuit board (20) includes first and second sections (22, 24) each having a first end bonded to the image sensor (12), which extend longitudinally from the image sensor (12) substantially perpendicular to the image pick-up surface (14) and substantially parallel to each other, and a third section (26) integrally formed with the second end of said second section (24).

(vi) Issues To Be Reviewed On Appeal

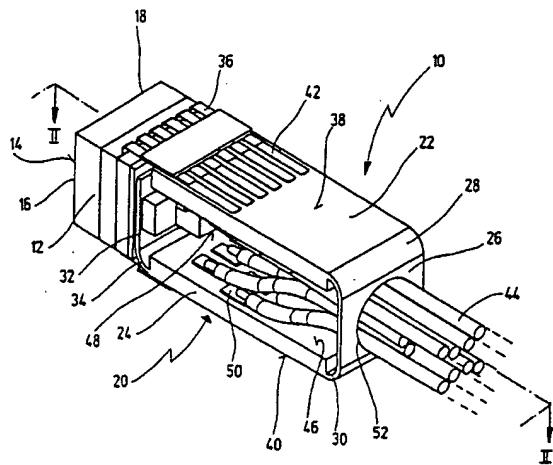
Claims 1-2, 8, 13-15, 17-19 and 21-24 stand rejected under 35 U.S.C. §103(a) as obvious over Pelchy, U.S. Patent No. 5,857,963 in view of Ito et al., U.S. Patent No. 5,454,366.

Claims 3-5 and 25 stand rejected under 35 U.S.C. §103(a) as obvious over Pelchy, U.S. Patent No. 5,857,963 in view of Ito et al., U.S. Patent No. 5,454,366, and further in view of Pelchy 5,754,313.

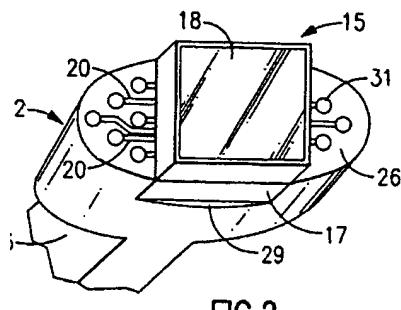
(vii) Argument

Independent Claim 1

Appellant respectfully submits that the Examiner's rejection of claim 1 is improper because there is simply no suggestion in the prior art to modify the structure of Pelchy '963 in the ways indicated by the Examiner in order to arrive at the present invention. It is, of course, the claim language that is relevant, and this is discussed in detail below. However, for ease of reference, figures representing the present invention and the Pelchy '963 device are reproduced below for a quick comparison of how fundamentally different these two devices actually are.



Present invention



Pelchy '963 Device

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As explained below, the basic, fundamental structure of these two devices is completely different. Appellant respectfully submits that the Examiner suggests drastic changes that completely change the Pelchy '963 design in such a way that one skilled in the art would clearly not make without the present application in front of them. This is a classic case of using the applicant's disclosure as a roadmap to piece together the claimed invention, which is improper. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332, 1337, 75 U.S.P.Q.2d 1051, 1054 (Fed. Cir. 2005).

As noted by the Examiner, Pelchy '963 does not anticipate independent claim 1 because all of the elements in this claim are not shown in this reference. First, claim 1 requires a circuit board folded from a planar blank circuit board. As noted by the Examiner, Pelchy '963 fails to disclose such a circuit board. See 9/1/05 Office Action at 5; 5/26/06 Office Action at 3.

Moreover, in addition to this, claim 1 requires first and second sections of the board "extending in spaced relation one to the other and obliquely or crosswise to said image sensor." Contrary to the Examiner's assertion, Pelchy '963 has no such sections. The "two top horizontal members 26" identified by the Examiner as the first and second sections is really just the single, horizontal leg of a T-shaped support member. See Col.3, Ins. 23-27. Accordingly, these "sections" clearly do not extend in spaced relation

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to one another. The leg 26 is also parallel to the image sensor mounted to it. See Figs. 1-2. (In fact, the leg 26 has a recess corresponding to the size of, and accommodating, the image sensor. See Col.3, Ins. 30-32). Accordingly, the leg does not extend “obliquely or crosswise” to the image sensor.

In the Advisory Action of August 10, 2006, the Examiner attempted to justify the assertion that this claim language was satisfied with several tenuous arguments. First, the Examiner points to the recess (29) where the image sensor (17) is disposed and states there is a discontinuity between the top “two” parallel horizontal members. See Advisory Action at 2. Appellant respectfully submits this argument is unreasonable. The “two” parallel members identified by the Examiner is really just a single, horizontal leg (26) with a small recess in its top surface for accommodating the image sensor. See Pelchy '963, Col.3, Ins 30-32. The leg 26 simply does not constitute “a first section and a second section extending in spaced relation one to the other.”

Second, the Examiner has provided an incredibly stretched interpretation of the phrase “obliquely or crosswise to said image sensor.” The Examiner cites an archaic definition for the term “crosswise” (i.e., “in the form of a cross”), then notes that “cross” is further defined as “to lie across or intersect,” and then states that the “two” sections (26) “meet at the image sensor” and therefore “intersect at the image sensor.” See Advisory Action at 2. Applicant respectfully submits that this is simply an unreasonable extrapolation. The claim language here obviously means that the first and second

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sections extend in a direction transverse to the image sensor. The leg (26) identified by the Examiner clearly does not comprises “a first section and a second section extending... obliquely or crosswise to said image sensor”.

The modifications that would be necessary in order to arrive at the present invention are numerous. Appellant respectfully submits that the T-shaped structure of Pelchy '963 is so fundamentally different from the structure of the present invention, as outlined above, that it is simply unreasonable to suggest that the claimed invention is an obvious modification of Pelchy '963.

First, Appellant notes that, in order for the claimed invention to be obvious over the prior art, there must be some suggestion or motivation in the prior art to make the relevant modification. See, e.g., MPEP 2143.01 (“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.”). Here, there is no such suggestion to modify Pelchy '963 as would be necessary in order to arrive at the present invention, as Pelchy '963 explicitly (and at some length) teaches to specifically use the T-shaped support member. As explained above, Pelchy '963 has a horizontal member (26) on which the imager package is mounted, and a single vertical member (25) extending down from the middle of the horizontal member, such that circuit

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components are mounted on either side of this single vertical member. See Fig.1. This T-shaped structure is a fundamental aspect of its design. See, e.g., Abstract; Col.1, Ins. 48-53; Claim 1. There is simply no suggestion that it would be desirable to change this basic nature of its design in order to arrive at the particular three-section, folded board recited in claim 1 of the present application. The fact that the basic design of Pelchy '963 could possibly be completely changed to arrive at the present invention, such hindsight is impermissible—there must have been some suggestion in the reference to do so. *In re Mills*, 916 F.2d 680, 682, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990) (fact that prior art “may be capable of being modified to run the way the apparatus is claimed, there must be some suggestion or motivation in the reference to do so.”).

Moreover, Appellant respectfully submits that, even if Ito were combined with Pelchy '963, this would still not produce the invention recited in claim 1. Specifically, Claim 1 requires that the “image sensor is arranged on one end of said circuit board opposite said third section.” However, the first, second and third sections of the folded board identified by the Examiner are all formed via fold lines that extend axially. See Ito, Fig. 5, Col.4, Ins 22-27. These sections, including the section “between” the first and second sections, all extend in parallel from the image sensor. The image sensor is not arranged at an opposite end of the board as the third section.

Though the Examiner repeats the same rejection and citations in the Advisory Action, the Examiner has still not indicated how there is a teaching of a third second

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arranged on the opposite end as the image sensor. See Advisory Action at 2-3. In fact, Appellant notes that, in Item 3 of the Advisory Action, the Examiner appears to be saying that the image sensor and the third section are on the same end, and opposite the first/second sections, though Appellant respectfully notes that this paragraph is somewhat unintelligible.

Appellant respectfully notes that all of these literal differences between the prior art references and the language of claim 1 are reflective of the basic structural differences between the present invention and the prior art. Appellant notes that it is clear from a simple comparison of the present invention to the prior art that these are completely different structures, and that that one skilled in the art looking at Pelchy '963 would not really make the drastic changes to it that would be necessary in order to arrive at the present invention. Appellant respectfully submits that the Examiner is attempting to reconstruct the claimed invention, using the Applicant's disclosure as a roadmap, to make modifications to Pelchy '963 that one skilled in the art would not really make (and that would still not produce the present invention), which is improper. See *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991) (suggestion must be found in the prior art, not the applicant's disclosure).

Independent Claim 22

Similar to independent claim 1, independent method claim 22 requires the folding of a planar blank board “in such a way that a third section is located between a first section and a second section, and *wherein said image sensor is bonded to said circuit board at an end of said board opposite said third section.*” As explained above, there is simply no suggestion to so completely change the basic nature of the Pelchy ‘963 device in order to use a board such as that disclosed in Ito or any other folded blank board. Moreover, as explained above, even if the combination of Pelchy ‘963 and Ito were made, this would still not result in the invention recited in claim 22, as this combination would still not disclose folding a blank board into three sections such that the image is bonded to the circuit board “at an end of said board opposite said third section.”

Independent Claim 24

Applicant submits that claim 24 recites even further clarifying distinctions from the prior art, reciting several particular aspects of the orientation of the image sensor and the different sections of the circuit board. Specifically, claim 24 recites that the first and second sections are “substantially parallel to each other” and “substantially perpendicular to the image pick-up surface” of the sensor, and that the sensor is

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bonded to the first end of the first and second sections, and that the third section is integrally formed with the second end of the second section. The cited references do not disclose this particular arrangement of the sections and image sensor, as they teach very different designs for all of the reasons discussed above.

Appellant notes that the Examiner did not even discuss independent claim 24 in the Final Office Action, having only stated “See Examiner’s notes regarding rejection of claim 1.” While the Examiner did finally substantively address this claim in the Advisory Action, Appellant respectfully notes that this paragraph (Item 4), is also somewhat unintelligible. As for the first and second sections, it is unclear what the Examiner believes are the two sections that are supposedly parallel to each other and perpendicular to the image pick-up surface. See Advisory Action at 3. As for the relative positions of the image sensor and the third section (i.e., located at different ends of the circuit board), it is unclear how the Examiner believes this specific claim language is satisfied, as the Examiner randomly cites parts of Pelchy ‘963 and randomly switches over to Ito. See Advisory Action at 3-4. Neither Pelchy ‘963 nor Ito teaches this specific arrangement.

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Conclusion

For all of the foregoing reasons, it is submitted that the claimed invention is patentable over the cited art. Accordingly, it is submitted that the rejection of claims 1-5, 8, 13-15, 17-19 and 21-25 should be reversed, and it is respectfully requested that the Examiner be directed to issue a Notice of Allowance allowing these claims.

Respectfully submitted,

August 28, 2006

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**Claims Appendix
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1. Image pick-up module, especially for an endoscope, comprising:

an electronic image sensor;

a single-piece circuit board which is electrically bonded to said image sensor, said circuit board having at least three sections integrally connected with one another, with a first section and a second section extending in spaced relation one to the other and obliquely or crosswise to said image sensor and a third section being arranged between the first and the second sections, said circuit board being folded from a planar board blank comprising at least said integrally formed first, second, and third sections, said third section of said blank being arranged between said first and second sections of said blank;

at least one cable electrically bonded to said circuit board and leading away from said circuit board;

wherein said image sensor is arranged on one end of said circuit board opposite said third section.

2. The image pick-up module of Claim 1, wherein said first and second sections extend substantially in parallel one to the other, and said third section extends obliquely or crosswise to said first and second sections.

3. The image pick-up module of Claim 1, wherein said third section has a substantially V-shaped configuration.
4. The image pick-up module of Claim 3, wherein two legs of said V-shaped third section extend along a straight-line prolongation of said first and said second sections, respectively.
5. The image pick-up module of Claim 3, wherein said third section has a substantially V-shaped configuration, and wherein said first and said second sections extend substantially in parallel one to the other.
8. The image pick-up module of Claim 1, wherein said at least one cable is bonded to an outer surface of said circuit board.
13. The image pick-up module of Claim 1, wherein an interior of said circuit board, defined by said first, second and third sections, is filled with an electrically non-conductive feeling compound.
14. The image pick-up module of Claim 1, wherein said circuit board comprises a forth section arranged opposite said third section and accommodating said image sensor on its outer surface.
15. The image pick-up module of Claim 13, wherein said forth section comprises at least one of an electric component and at least one electric circuit-board conductor.

17. The image pick-up module of Claim 1, wherein said circuit board is provided on its outer surface with recesses for bonding of said image sensor.
18. The image pick-up module of Claim 1, wherein said third section of said circuit board comprises at least one contact for bonding said cable leading away from said circuit board.
19. The image pick-up module of Claim 1, wherein said third section of said circuit board comprises at least one electric circuit-board conductor for electrically connecting said first section and said second section.
21. The image pick-up module of Claim 1, wherein said first section and said second section of said board blank are flexibly connected via an additional section, but are arranged in spaced relationship at one and the same level, wherein said first section and said second section each serve for bonding said at least one cable, and wherein said third section is flexibly connected to said additional section on an end face of said additional section.
22. A method for assembling an image pick-up module, comprising the steps of:
 - electrically bonding an electronic image sensor to a single-piece circuit board;
 - electrically bonding at least one cable leading away from said circuit board to said circuit board;

wherein said circuit board initially has the form of a planar board blank comprising at least three sections integrally connected with one another that can be folded along flexible connecting sections, wherein said at least one cable is bonded to said board blank, wherein said board blank is then folded in such a way that a third section is located between a first section and a second section, and wherein said image sensor is bonded to said circuit board at an end of said board opposite said third section.

23. The method of claim 22, wherein after bonding of said at least one cable an interior of said circuit board is filled up with a curing electrically non-conductive filling compound.

24. Image pick-up module, especially for an endoscope, comprising:

an electronic image sensor including an image pick-up surface;

a circuit board electrically bonded to said image sensor, said circuit board comprising

first and second sections, said first and second sections each having a first end bonded to said image sensor and a second end, wherein said first and second sections extend longitudinally from said image sensor substantially perpendicular to the image pick-up surface of said sensor and substantially parallel to each other; and

a third section integrally formed with the second end of said second section;

at least one cable electrically bonded to said circuit board and leading away from said circuit board.

25. The image pick-up module of Claim 24, wherein said third section has a substantially V-shaped configuration.

**Evidence Appendix
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No evidence of any kind, including evidence submitted under 37 CFR 1.130, 1.131 or 1.132, has been entered by the Examiner and relied upon by Appellant in the appeal.

**Related Proceedings Appendix
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There are no related Appeals or Interferences. As such, there are no decisions rendered by a court or the Board in any such Appeals or Interferences.